The Capacity of the Prosthetic Profession to Provide Lower Extremity Prosthetic Limbs Within the State of Georgia

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Background & Significance

- Due to an aging population and a rise in conditions known to increase the risk of amputation, demand for prosthetic services is thought to be increasing nation wide.

  (Nielsen 2002, Michael 2005, Corathers & Janczewski 2006)
- 20% of certified practitioners will reach retirement age within the next ten years.

  (Nielsen 2002)
- A recent National Commission on Orthotic and Prosthetic Education (NCOPE) study highlights the need to substantially increase the number of educational programs and the number of graduates becoming certified to meet the demand for services.

  (Nielsen 2002)

Background & Significance

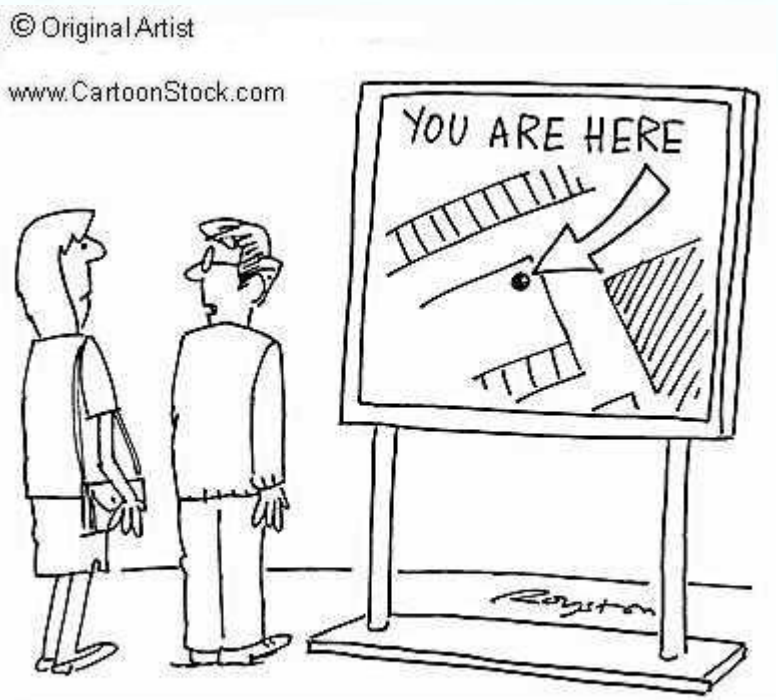
- While there are a handful of published articles examining the incidence of limb loss in the USA, there are very few studies which consider the demand for prosthetic services.

- Very little is know about actual services rendered.

(Nielsen 2002, Michael 2005, Corathers & Janczewski 2006)

Background & Significance

- It is difficult to know where to go if you don't know where you are!



- What is the scale of the shortage in Georgia?

Capacity	Demand
•Manufacturers' prosthetic foot sales data •Prostheses billed to Medicare •Number of practitioners oThe American Board for Certification (ABC) oThe Board for Orthotist / Prosthetist Certification (BOC)	•Incidence & Prevalence •Amputation risk factors •GA population oage strata ooccupation osex orace oeconomic status

Aims

- **To determine the number of lower limb prostheses fabricated per ABC and BOC certified prosthetist in GA during the years 2000 and 2004.**

- Investigate the lifespan of a prosthesis.

- In light of services rendered, estimate the ability of Georgia's prosthetists to meet demand based on published incidence and prevalence data.

Methods:
Foot Sales

- 2000 & 2004 prosthetic foot sales and returns data was solicited from the following:

Manufacturers

- **Bauerfeind**
- **Campbell-Childs, Inc.**
- **College Park Industries**
- **Dycor**
- **Endolite**
- **Freedom Innovations**
- **Kingsley Mfg. Co.**
- **MICA Mfg. Corp.**
- **Ossur**
- **Otto Bock**
- **Ohio Willow Wood**
- **Trulife-Seattle**

Distributors

- **Cascade Orthopedic Supply**
- **Fillauer LLC**
- **PEL Supply Co.**
- **Smith Global**
- **Southern Prosthetic Supply**

Methods:
Prostheses billed to Medicare

- Palmetto GBA was asked to identify the number of times the “Base” L-Codes for lower limb prostheses were submitted for billing in the years 2000 and 2004.

*Palmetto GBA is the Durable Medical Equipment Regional Carrier (DMERC) for Medicare Region C.

Methods:
Prostheses billed to Medicare

- Prosthetic Base Codes for Symes – proximal. Endoskeletal, exoskeletal, post-op & preparatory.
- **L5050, L5060, L5100, L5105, L5150, L5160, L5200, L5210, L5220, L5230, L5250, L5270, L5280, L5300, L5301, L5310, L5311, L5320, L5321, L5330, L5331, L5340, L5341, L5400, L5410, L5420, L5430, L5450, L5460, L5500, L5505, L5510, L5520, L5530, L5535, L5540, L5560, L5570, L5580, L5585, L5590, L5595, L5600.**

Methods:
Prostheses billed to Medicare

- Total sales was then estimated by extrapolating the Medicare information assuming Medicare sales represent 58% of total sales.
  - National estimate from Healthcare Cost & Utilization Project (HCUP) Nationwide Inpatient Sample (NIS), 2002, Agency for Healthcare Research and Quality (AHRQ).

(Nohre)

Methods:
of Practitioners

- The number of Georgia based American Board for Certification (ABC) and Board for Orthotist / Prosthetist Certification (BOC) certified prosthetists was solicited from their respective certifying agencies.

Board for Orthotist/Prosthetist Certification
THE ADVANTAGE IS EXPERIENCE™

Methods:

Prostheses fabricated per practitioner

- Certified Prosthetist Orthotists (CPOs) will be treated as half a prosthetist.
- Assume 95% of prosthetists are in clinical practice.

(Nielsen - 2002)

$$\frac{\text{\# of lower limbs fabricated}}{\text{“Clinical prosthetists”}} = \text{limbs fabricated per practitioner}$$

Results

- Prosthetic Foot Sales:
  - Of the 17 companies solicited, 13 have provided data.
  - All distributors have provided data.
  - 1 company discontinued sales of prosthetic feet prior to the time period studied.
  - 3 companies have not provided data on their direct sales.

Results

- Total number of prosthetic feet sold to facilities within Georgia:

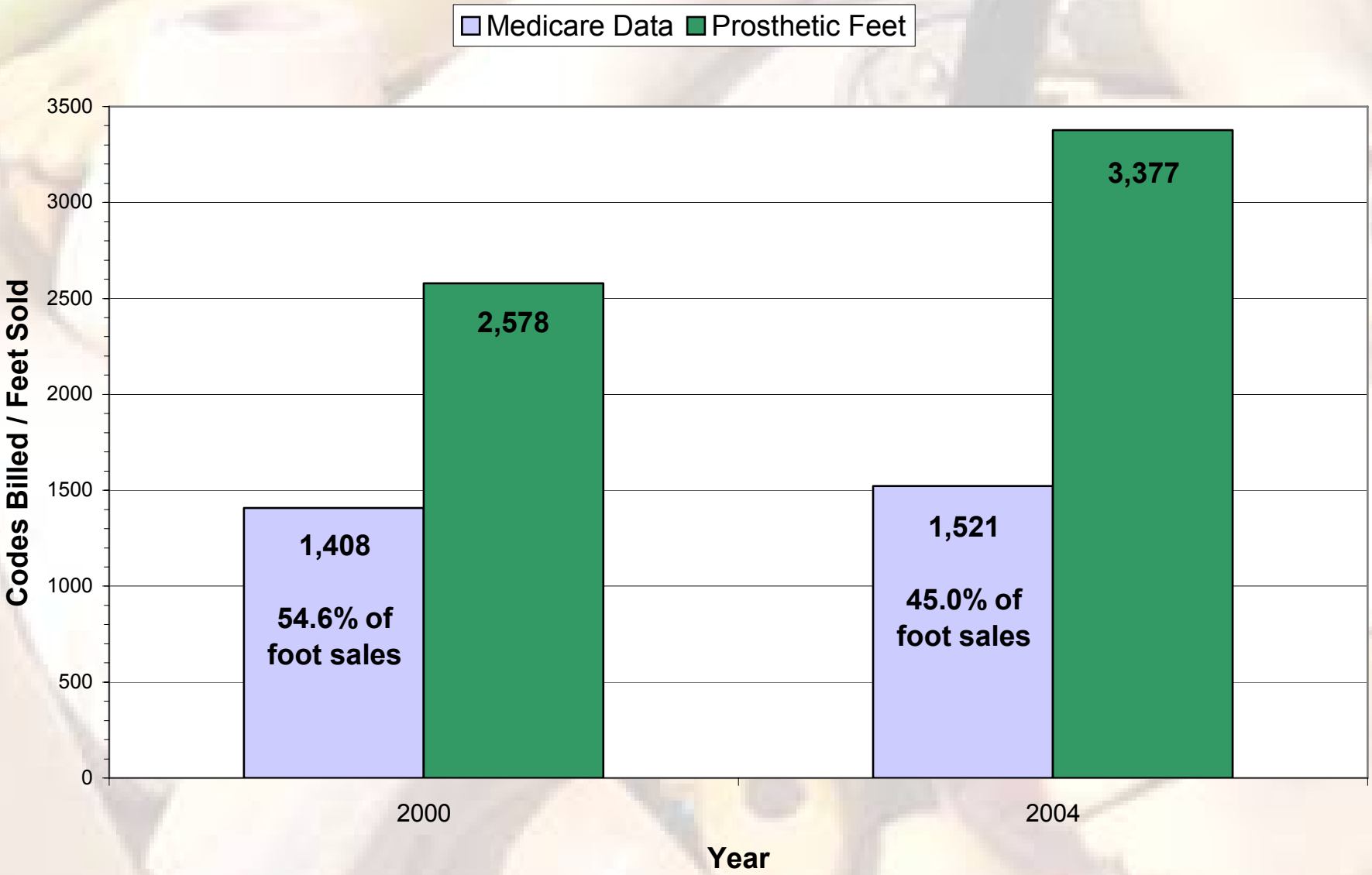
YEAR	FEET SOLD MINUS RETURNS
2000	2,578
2004	3,377

Results

- Total number of lower-limb base codes submitted to Medicare from Georgia providers:

YEAR	Total units
2000	1,408
2004	1,521

Results

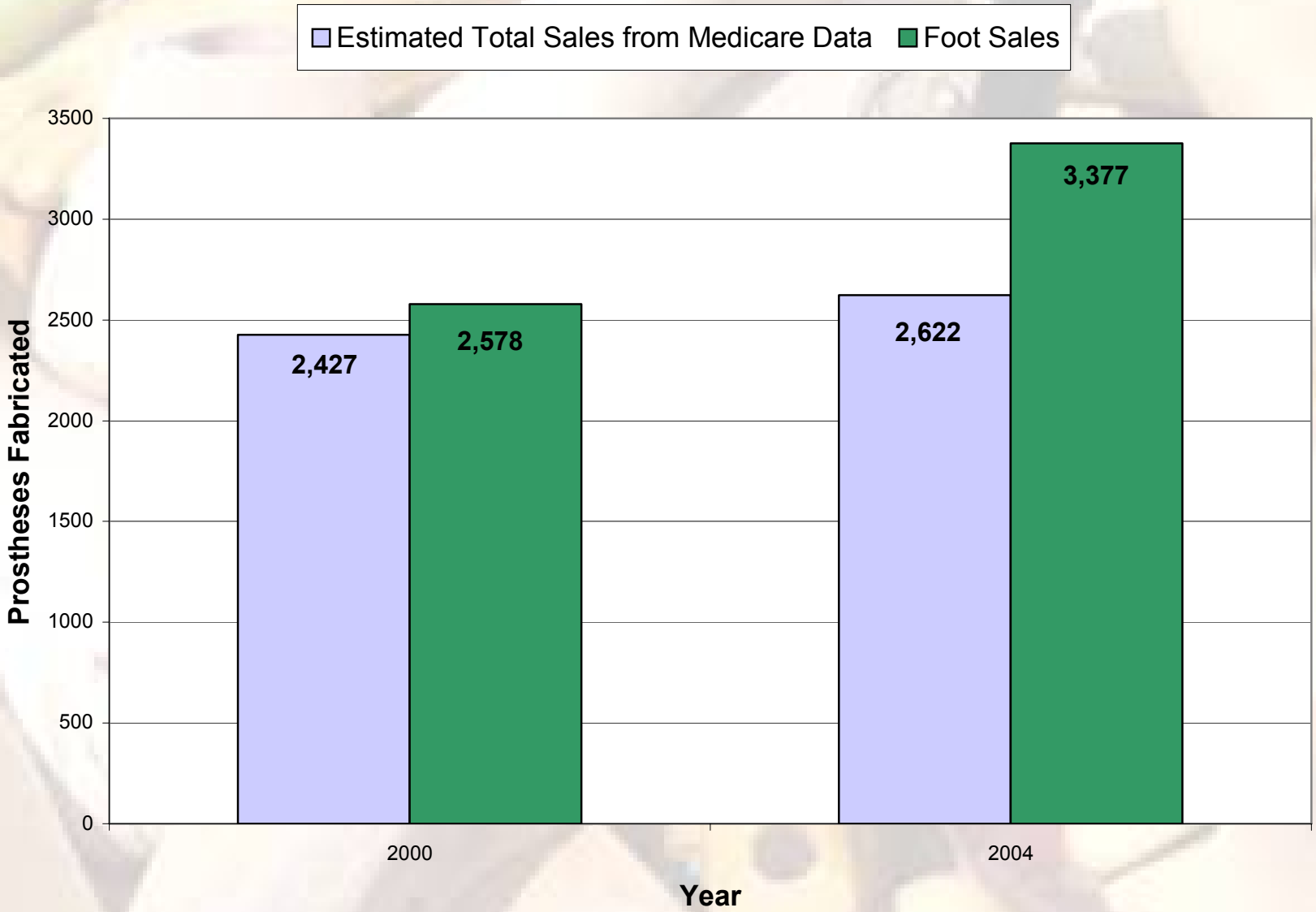

Medicare Data
Prosthetic Feet
3500
3000
2500
2000
1500
1000
500
0
Codes Billed / Feet Sold
1,408
54.6% of foot sales
2,578
1,521
45.0% of foot sales
3,377
2000
2004
Year

Results

- Total sales assuming Medicare sales represent 58% of total sales.

	2000	2004
Medicare	1,408	1,521
Total Sales	**2,427**	**2,622**

Results


Estimated Total Sales from Medicare Data
Foot Sales
Prostheses Fabricated
3500
3000
2500
2000
1500
1000
500
0
2,427
2,578
2,622
3,377
2000
2004
Year

Results

	2000	2004
CPs + BOCPs	37	37
CPOs + BOCPOs	43	53
Total	80	90

Board for
Orthotist/Prosthetist
Certification
THE ADVANTAGE IS EXPERIENCE™

Results:

Prostheses fabricated per prosthetist* **

	2000	2004
Based on Medicare as 58% of total sales:	44	44
Based on total foot sales:	46	56

*CPOs & BOCPOs are considered ½ a prosthetist.

**Assume 95% of practitioners are in clinical practice.

Conclusion

- Medicare sales represented 54.6% of total foot sales in 2000, and 45.0% in 2004.
- Medicare sales increased by 235 units while foot sales increased 799 units.
- Insufficient evidence to explain this change in payer mix.

Conclusion

- Taking foot sales to represent total number of limbs fabricated, practitioners increased their efficiency by 22%.
- Possible explanations:
  - Increased use of central fab and CAD/CAM.
  - Hired more technicians and/or certified fitters.

Conclusions

- Assuming Medicare sales to represent 58% of total limbs produced, the rates of production remained equal. (44/practitioner).
- In 2000, the extrapolated Medicare sales are 151 units short of foot sales, but 755 units short in 2004.

Conclusion

- Limitations:
  - Why the inconsistency in the Medicare data to foot sales ratio in the years studied?
    - Incomplete prosthetic foot sales data.
      - Proprietary data is difficult to obtain.
    - Possible incorrect foot sales data.
    - Medicare data may be skewed by attempts at fraud and abuse.
    - Medicare policy changes.
    - Possible change in the GA amputee patient demographics.

Conclusion

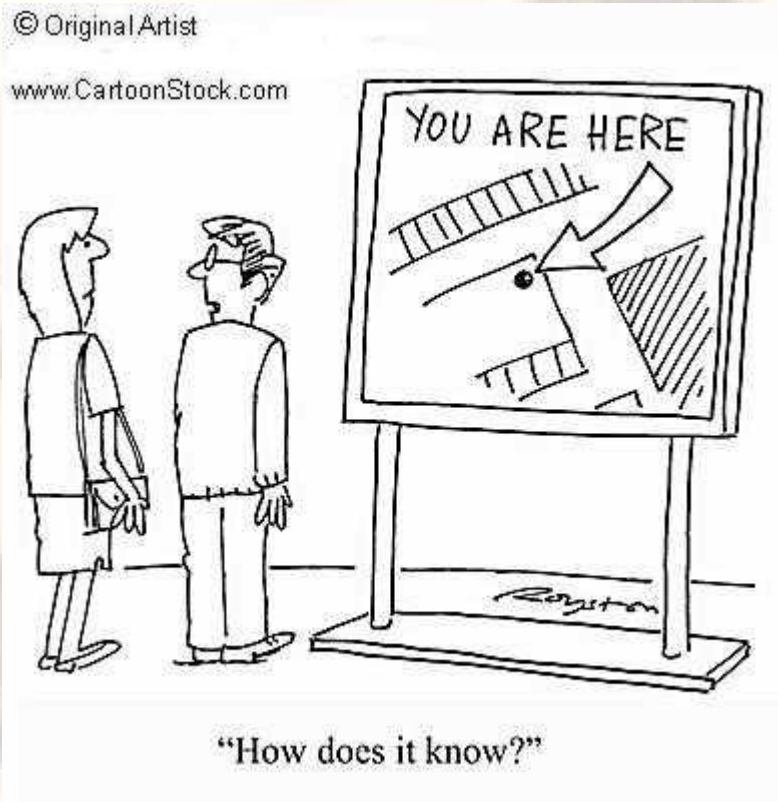
- The data collected represents the only estimate of lower limb prostheses fabricated in GA in 2000 & 2004.
  - Nielsen, in a 2002 report to NCOPE, suggested a prosthetist can see up to 250 patients a year.
- The data also represents the only estimate of prostheses fabricated per practitioner, and the only study to capture services rendered beyond Medicare beneficiaries.

Conclusion

- Limitations:
  - Assumed 1 prosthetic foot per lifespan of the prosthesis.
  - Assumed all facilities operate in the same manner and at 100% capacity.
  - Assumed CPO's spend 50% of their time on prosthetics.
  - Assumed 95% of practitioners are in clinical practice.

Conclusion

- We have a good idea where we are, but we're still lacking sufficient information to know where to go.



Future Study

- Investigate incidence & prevalence of amputees in need of prosthetic services.
- Investigation of payer mix.
- Investigate percentage of certified practitioners in clinical practice.
- Expand existing study to a national scale.

Discussion

- 1996 incidence rates of major LL amputation per 100,000 US population standardized to 1988 population by age, sex, geographic region:
  - 2° dysvascular condition: 24.8
  - 2° trauma: 1.05
  - 2° cancer: 0.17
  - Per 100,000 live births: 6.19

(Ephraim – 2002)

Incidence

- Assume rates stay the same for 2000 & 2004.
- 2000 GA population: 8,186,453
- 2004 GA population: 9,072,576
  - (U.S. Census Bureau)

	2000	2004
Major LEA 2° dysvascular	2,030	2,250
Major LEA 2° trauma	86	95
Major LEA 2° cancer	14	15
Major congenital LE limb deficiency:	8	?
Total	**2,138**	**2,360**

Prevalence

	2000	2005
USA Population (US Census Bureau)	281,421,906	296,410,404
# Amputees in USA -excluding fingers & toes (Nielsen)	1,752,838	1,904,035
Subtract 3% - UL amputations (Dillingham)	- 52,585	- 57,121
Subtract 10% - partial foot (Dillingham)	- 170,025	- 190,404
Major lower limb amputations in USA	1,530,228	1,656,510
% of population	**0.54%**	**0.56%**

Discussion

	2000	2005
GA population	8,391,282	9,072,576
*Assume GA demographics = USA demographics	0.54% = **45,313**	0.56% = **50,806**
Assume 75% of amputees use prostheses – (Nielsen)	33,958	38,104
Assume lifespan of prosthesis = 3 yrs (informal survey)	**11,328**	**12,701**

Discussion

	2000	2004
Limbs fabricated (est. from foot sales data)	2,578	3,377
Demand	11,328	12,701 (2005)
Shortage	**188 CPs**	**163 CPs**

Refrences

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Thank You!

- **Robert Kistenberg, MPH, CP, FAAOP**
- **Stephen Sprigle, PhD, PT**

Survey Results

	How often need new prosthesis
14 CPs	2.86 years σ = 0.99
9 CPOs	3.11 years σ = 1.06
3 Unknown	2.67 years σ = 0.47
26 Total	2.92 years σ = 1.00

How often does an individual require a new prosthesis?